

WHAT IS CLAIMED IS:

1. An apparatus comprising:
 - (a) a base having a front face, a rear face and at least one side face,
5 and
 - (b) at least two supports wherein each of said supports has at least one face and wherein each of said supports is affixed to said base by alignment of a portion of at least one face of said base and a portion of at least one face of said support, wherein at least one of said supports has attached thereto a component of an ion optics
10 system for a mass spectrometer.
2. An apparatus according to Claim 1 wherein said alignment is at 90 degrees.
- 15 3. An apparatus according to Claim 1 wherein at least one of said supports has at least two faces and at least a portion of each of said two faces is aligned with two faces of said base.
- 20 4. An apparatus according to Claim 1 comprising a plurality of supports with attached components comprising an ion source and a detector and optionally one or more of a pulser, an ion mirror and an Einzel lens and said alignment results in a relationship between said components that is within acceptable tolerances.
- 25 5. A mass spectroscopy apparatus comprising an apparatus according to Claim 1.
- 30 6. An apparatus according to Claim 1 wherein said supports are affixed to said front face of said base and said front face or said rear face has at least one groove therein.
7. An apparatus according to Claim 6 wherein an electrical lead is sequestered in said groove and said apparatus further comprises a shielding plate covering said groove.

8. An apparatus according to Claim 1 wherein said base further comprises at least one opening therethrough.

9. An apparatus according to Claim 8 wherein at least one of said supports 5 is affixed to said base by the alignment of a portion of at least one face of said support and a portion of a face of said opening.

10. A mass spectroscopy apparatus comprising components of an ion optics system for a mass spectrometer affixed to a mounting base, each of said components 10 being affixed to a support, each of said supports having at least one support mating face, wherein said mounting base comprises a plurality of base mating faces respectively corresponding to a respective support mating face, wherein said support mating faces and said base mating faces are configured and dimensioned such that when said support mating faces are brought together in registration with said respective base mating faces, 15 said components are optically aligned within acceptable tolerances.

11. A mass spectroscopy apparatus according to Claim 10 wherein a support 20 mating face comprises a first guide and a corresponding base mating face comprises a second guide complementary to said first guide and said corresponding mating faces are brought together in registration by apposing said first guide and said second guide.

12. A mass spectroscopy apparatus according to Claim 11 wherein said 25 guides are complementary geometrical shapes.

13. A mass spectroscopy apparatus according to Claim 10 wherein a mating face comprises a planar surface adjacent an outside edge and a corresponding mating face comprises a planar surface adjacent an inside edge and said corresponding mating faces are brought together in registration by apposing said respective planar surfaces and edges.

30 14. A mass spectroscopy apparatus according to Claim 10 wherein said mounting base is a generally flat member having first and second surfaces and a finite thickness, and wherein said support mating face comprises a planar surface adjacent an inside edge, and said corresponding base mating face comprises a planar surface that

forms an outside edge where it intersects said first mounting block surface, and said mating faces are brought together in registration by apposing said respective planar surfaces and edges.

5 15. A mass spectroscopy apparatus according to Claim 14 wherein said outside edge formed by intersection of said base mating surface and said support mating surface defines a straight line.

10 16. A mass spectroscopy apparatus according to Claim 14 wherein said base mating surface is orthogonal to said support mating surface.

15 17. A mass spectroscopy apparatus according to Claim 10 comprising a time-of-flight mass spectrometer, said components comprising at least one of an ion source, a pulser, an ion mirror or a detector.

18. A mass spectroscopy apparatus according to Claim 17 wherein said components further comprise an Einzel lens.

20 19. A mass spectroscopy apparatus according to Claim 10 wherein said supports are affixed to a front face of said mounting base and said front face or a rear face has at least one groove therein, wherein an electrical lead is sequestered in said groove and said mounting base further comprises a shielding plate covering said groove.

25 20. A method for constructing an apparatus comprising a plurality of components of an ion optical system for a mass spectrometer, said method comprising:

(a) bringing together (i) a base having a front face, a rear face and at least one side face, and (ii) a plurality of supports wherein each of said supports has at least one face and wherein each of said components is attached or is attachable to one of said supports,

30 (b) aligning at least a portion of a face of each of said supports with a corresponding portion of at least one face of said base and

(c) securing said portions to one another,
wherein said components of said ion optical system for a mass spectrometer are attached to said supports prior to or subsequent to said step (c) and wherein said portions of said

faces are configured and dimensioned such that when said portions are secured, said components are optically aligned within acceptable tolerances

21. A method according to Claim 20 wherein said components comprise an
5 ion source and a detector and optionally one or more of a pulser, an ion mirror, and an Einzel lens.

22. A method according to Claim 20 wherein said components comprise an
ion source and a detector and optionally one or more of a pulser and an ion mirror
10 wherein said components are aligned in a parallel relationship.

23. A method according to Claim 20 wherein said base further comprises at least one opening therethrough.

15 24. An apparatus according to Claim 23 wherein at least one of said supports is affixed to said base by the alignment of a portion of at least one face of said support and a portion of a face of said opening.

20 25. A method according to Claim 20 wherein said supports are affixed to said front face of said base and said front face or said rear face has at least one groove therein, wherein an electrical lead is sequestered in said groove and said mounting base further comprises a shielding plate covering said groove.

25 26. A method of constructing a mass spectroscopy apparatus comprising components of an ion optics system for a mass spectrometer, said method comprising:

30 (a) affixing to a mounting base each component of an ion optics system for a mass spectrometer, each of which are affixed to a support either prior to or after said support is affixed to said mounting base, each of said supports having at least one support mating face, wherein said mounting base comprises a plurality of base mating faces respectively corresponding to a respective support mating face, wherein said support mating faces and said base mating faces are configured and dimensioned such that when said support mating faces are brought together in registration with said respective base mating faces, said components are optically aligned within acceptable tolerances,

(b) securing said mounting base to a frame of said mass spectroscopy apparatus.

27. A method according to Claim 26 wherein said components comprise an ion source and a detector and optionally one or more of a pulser, an ion mirror, and an Einzel lens.

28. A method according to Claim 26 wherein said components comprise an ion source and a detector and optionally one or more of a pulser and an ion mirror wherein said components are aligned in a parallel relationship.

29. A method according to Claim 26 wherein said supports are affixed to a front face of said mounting base and said front face or a rear face has at least one groove therein, wherein an electrical lead is sequestered in said groove and said mounting base further comprises a shielding plate covering said groove.

30. A scientific apparatus for use in high vacuum environments, said apparatus comprising at least one electrical connection therein resulting from a base having a groove in at least one face thereof wherein an electrical lead is sequestered in said groove and wherein a shielding plate covers said groove.

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